

*Keyes Report*

Katherine Keyes, PhD Expert Report

MDL Case Track 3  
*Case No. 1:18-op-45032 and No. 1:18-op-45079 Opioid Litigation*

## **EXHIBIT A**

Curriculum Vitae

Exh. A-1



P-23117 \_ 00001

*Keyes Report*

**Katherine M. Keyes, PhD**  
 Department of Epidemiology  
 Columbia University  
 722 West 168th Street  
 New York, NY 10032  
 (212) 305-6706  
 kmk2104@columbia.edu

**Date of Preparation:** April 9<sup>th</sup>, 2021

**Personal Data:**

Name: Katherine Keyes  
 Birthplace: Minneapolis, MN  
 Citizenship: USA

**Academic Appointments/Work Experience**

7/1/2016 – Present	<b>Department of Epidemiology</b> <b>Mailman School of Public Health, Columbia University</b> <i>Associate Professor of Epidemiology (tenured March 2020)</i>	New York, NY
2/1/2012 – 6/30/2016	<b>Department of Epidemiology</b> <b>Mailman School of Public Health, Columbia University</b> <i>Assistant Professor of Epidemiology</i>	New York, NY
11/15/2010- 1/31/2012	<b>Mailman School of Public Health, Columbia University</b> <i>Instructor in Epidemiology</i>	New York, NY
7/1/2013 – 6/30/2016	<b>Department of Psychiatry</b> <b>Mailman School of Public Health, Columbia University</b> <i>Assistant Professor of Epidemiology (in Psychiatry)</i>	New York, NY
1/2015 – Present	<b>Survey Research Center, Institute for Social Research</b> <b>University of Michigan</b> <i>Adjunct Research Assistant Professor</i>	Ann Arbor, MI
7/2018 – Present	<b>Society and Health Research Center</b> <b>Universidad Mayor</b> <i>Adjunct Associate Professor</i>	Santiago, Chile

Exh. A-2

*Keyes Report*

**Katherine M. Keyes, PhD**  
 Department of Epidemiology  
 Columbia University  
 722 West 168th Street  
 New York, NY 10032  
 (212) 305-6706  
[kmk2104@columbia.edu](mailto:kmk2104@columbia.edu)

**Compensation**

Reviewing materials and writing report: \$400 per hour  
 Deposition and trial testimony: \$550 per hour

Exh. C-2

P-23117 \_ 00134

*Keyes Report***Education**

09/2006 – 06/2010	<b>Columbia University, Mailman School of Public Health</b> PhD: Epidemiology, June 2010 Thesis title: <i>Ecologic-level disapproval and the prevalence of substance use: A multi-level age-period-cohort analysis of high-school attending adolescents in the United States</i> Sponsor: Deborah Hasin	New York, NY
09/2004 – 05/2006	<b>Columbia University, Mailman School of Public Health</b> MPH: Epidemiology, May 2006	New York, NY
09/1998 – 12/2001	<b>University of Minnesota</b> BS: Finance, BA: Theater Arts, December 2001	Minneapolis, MN

**Training**

06/2010 – 01/2012	<b>Columbia University</b> <i>Epidemiology Merit Post-Doctoral Fellow</i>	New York, NY
09/2006 – 06/2010	<b>Columbia University</b> <i>Psychiatric Epidemiology Pre-Doctoral Training Fellow (T32 MH013043. PI: Link)</i>	New York, NY

**Honors and Awards**

Carol J. Rowland Hogue Mid Career Award, Society for Epidemiologic Research, 2020  
 NIH Early-Stage Investigator, Office of Disease Prevention, 2017  
 Robins-Guze early career investigator award, American Psychopathological Association, 2016  
 Michelle Tansella Award, World Psychiatric Association Epidemiology section, 2016  
 Calderone Junior Faculty Prize, Mailman School of Public Health, Columbia University, 2016  
 Tow Scholarship, Mailman School of Public Health, Columbia University, 2015  
 Research Society on Alcoholism Young Investigator Award, 2015  
 Columbia Psychiatric-Neurological Epidemiology Early Investigator Award, 2012  
 Robert Wood Johnson Health and Society Scholars Fellowship, 2010 (declined)  
 William Farr Award in Epidemiology, Columbia University, 2010  
 Student Merit Travel Award, Research Society on Alcoholism, 2009  
 Student award, Epidemiology Section, American Public Health Association, 2009  
 First place, Division 50 Student Poster Competition, American Psychological Association, 2009  
 National Institute of Drug Abuse Travel Award, American Psychological Association, 2009  
 Student Merit Travel Award, Research Society on Alcoholism, 2008  
 Gordis Award for outstanding student research, Research Society on Alcoholism, 2008  
 Lilienfeld Prize for Student Research, Society for Epidemiologic Research, 2008

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Keyes Report

Student Merit Travel Award, Research Society on Alcoholism, 2007  
Finalist, Gordis Award for outstanding student research, Research Society on Alcoholism, 2007  
Women & Gender Junior Investigator Award, College on Problems of Drug Dependence, 2006  
Student Merit Travel Award, Research Society on Alcoholism, 2006

Administrative Leadership and Academic Service

ACADEMIC SERVICE

- Methods qualifying exam committee, 2015-present

ADMINISTRATIVE LEADERSHIP AT CUMC AND NYP

- Irving Institute for Clinical and Translational Research, KL2 career and training award reviewer, 2017-2019

Professional Organization and Societies

MEMBERSHIPS AND POSITIONS

American Psychopathological Association (2006-present)

- Nominations committee, 2013
- Robins-Guze early career investigator award recipient, 2017

Research Society on Alcoholism (2006-present)

- Program committee, 2015-present
- Young Investigator Award recipient, 2015

Society for Epidemiologic Research (2007-present)

- Lilienfeld award recipient, 2008
- Education committee member, 2015-2018
- Education committee chair, 2019-present
- Member-at-Large, Executive committee, 2018-present
- Carol Hogue Mid-Career Award recipient, 2020

Society for Research on Child Development (2012-present)

- Thornberg Dissertation Award committee, 2014-2018
- Communications committee, 2017-2019

World Psychiatric Association Epidemiology and Public Health Section (2011-present)

- Michelle Tansella Award recipient, 2016
- Executive committee, 2016-present
- Local host of 2018 meeting, held at Columbia University, New York, May 2-4th, 2018

NIH STUDY SECTIONS

- NIAAA: AA1: Biomedical Research Review Subcommittee, November 9th, 2015
- NIAAA: AA1: Biomedical Research Review Subcommittee, July 11th, 2016
- NIDA: Special Emphasis Panel: PAR-16-24: Accelerating the Pace of Drug Abuse Research Using Existing Data, November 4th, 2016

Exh. A-4

Keyes Report

Katherine Keyes, PhD Expert Report

MDL Case Track 3

Case No. 1:18-op-45032 and No. 1:18-op-45079 Opioid Litigation

EXHIBIT C

Compensation

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*Keyes Report*

*All Expert Witness reports, from MDL 2804 served on March 25, 2019 and May 10, 2019 as well as materials identified within, and any supplements, errata, or attachments associated with them.*

*All Expert Witness reports from the NY Opioid Litigation 400000/2017 served on December 19, 2019 and February 3rd, 2020 as well as materials identified within and any supplements, errata, or attachments associated with them.*

*All Expert Witness reports from Cabell County Commission and City of Huntington, West Virginia, (The Cabell Huntington Community) v. AmerisourceBergen Drug Corporation, Cardinal Health, Inc., and McKesson Corporation served on August 3, 2020 as well as materials identified within, and any supplements, errata, or attachments associated with them.*

*All items referenced in Dr. Keyes's expert witness reports or listed on Materials Considered lists.*

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- NIAAA: AA2: Epidemiology, Prevention and Behavior Research Review Subcommittee, March 6th, 2017
- Social Sciences and Population Studies-B (SSPB) study section, June 15th, 2017
- NIAAA: AA1: Biomedical Research Review Subcommittee, July 14th, 2017
- NIAAA: AA2: Epidemiology, Prevention and Behavior Research Review Subcommittee, March 5th, 2018
- NIDA: Special Emphasis Panel: PAR-16-24: Accelerating the Pace of Drug Abuse Research Using Existing Data, March 1st, 2018
- CSR Special Emphasis Panel: Tobacco Control Policies to Reduce Health Disparities, March 29, 2019.
- NIAAA: AA2: Epidemiology, Prevention and Behavior Research Review Subcommittee, Standing member. 2019-present

*NATIONAL COMMITTEE MEMBERSHIP*

National Academy of Sciences, Engineering, and Medicine: Health and Medicine Division  
“Accelerating the Progress to Reduce Alcohol-Impaired Driving Fatalities”  
2017-2018

*JOURNAL REVIEWER (selection)*

Addiction; Alcoholism: Clinical and Experimental Research; American Journal of Epidemiology; American Journal of Psychiatry; American Journal of Public Health; Archives of General Psychiatry; BMC Psychiatry; British Journal of Psychiatry; Contemporary Drug Problems; Demography; Depression and Anxiety; Drug and Alcohol Dependence; Epidemiology; International Gambling Studies; International Journal of Epidemiology; JAMA; JAMA Pediatrics; JAMA Psychiatry; Journal of Nervous and Mental Diseases; Journal of Psychiatric Research; Journal of Traumatic Stress; Journal of Studies on Alcohol and Drugs; Molecular Psychiatry; New England Journal of Medicine; Preventive Medicine; PLoS One; Psychological Medicine; Social Psychiatry and Psychiatric Epidemiology; Social Science and Medicine; Substance Abuse Treatment, Prevention, and Policy; others.

*ABSTRACT REVIEW*

Society for Epidemiologic Research

*EDITORIAL BOARD*

*CURRENT*

- Drug and Alcohol Dependence, Associate Editor, 2015 to present
- American Journal of Public Health, guest editor, Special Issue: “Improving Population Mental Health in the 21st Century”, 2019
- Alcoholism: Clinical and Experimental Research, Field Editor, 2014 to present
- Injury Epidemiology, Associate Editor, 2013 to present

*FORMER*

- BMC Psychiatry, Associate Editor, 2011 to 2015

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*Keyes Report*

- Social Psychiatry and Psychiatric Epidemiology, Editor of commentaries and editorials, 2014 to 2016

## CONSULTING

Expert witness, National Prescription Opioid Litigation, Multi-district Litigation, Tracks 1, 1b, 2, 3, 4  
 Expert witness, New York State opioid litigation, retained by the People of the State of New York

**Fellowship and Grant Support**

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## PENDING RESEARCH FUNDING

**“Temperature, shade, and adolescent psychopathology; understanding how place shapes health”**

Role on Project: Co-Principal Investigator and Contact PI (with Andrew Rundle)

Dates of funding: 9/1/2021-8/31/2026

Funder: National Institute of Mental Health

Total annual direct and indirect costs: \$472,672

**“Standardized and Linked Real-World Data and Informatics Infrastructure to Study Post-Acute Sequelae of SARS-CoV-2 Infection across New York City” (PI: Pathak)**

Role on Project: Co-Investigator and PI of Columbia Subcontract

Dates of funding: 5/15/2021-5/14-2026

Funder: National Institutes of Health

Total direct and indirect costs: TBD

**“Leveraging the Social Media App Parler to Monitor Threats of Firearm and Other Violence: Implications for Prevention of Mass Violence”**

Role on Project: Principal Investigator

Dates of funding: 8/1/2021-7/30-2024

Funder: National Institute of Justice

Total direct and indirect costs: \$600,000

## ACTIVE RESEARCH FUNDING

**“The representative brain: how sampling bias influences scientific discovery of the neural underpinnings of adolescent health”**

Seed Grant for Interdisciplinary Projects in Society and Neuroscience

Role on Project: Principal investigator

Dates of funding: 3/15/2021-4/15/2022

Funder: Presidential Scholars in Society and Neuroscience

Total direct and indirect costs: \$50,000

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1750. TRUM004839066

1751. TRUM004839199

1752. TRUM004839368

1753. TRUM004839415

1754. TRUM004839416

1755. TRUM004839417

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1776. TRUMBULL\_ESI\_000478042

1777. TRUMBULL\_ESI\_000478250

1778. WV – HUNT\_00063590

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Exh. B-78

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1719. TRUM004707727  
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 1746. TRUM004838234  
 1747. TRUM004838235  
 1748. TRUM004838239  
 1749. TRUM004839063

Exh. B-77

*Keyes Report***“Research Training Program in Psychiatric Epidemiology” (PI: Keyes)**

T32 MH013043

Role on project: Principal investigator and director

Dates of funding: 7/1/1972-6/30/2022

Funder: National Institute of Mental Health

Total annual direct and indirect costs: \$403,961

**“Suicide as a contagion: modeling and forecasting emergent outbreaks” (PIs: Keyes and Shaman)**

R01 MH 121410

Role on project: Co-principal Investigator and contact PI (multiple PI with Jeff Shaman)

Dates of funding: 01/24/2020-11/30/2024

Funder: National Institute of Mental Health

Total annual direct and indirect costs: \$665,349.00

**“As adolescent substance use declines, internalizing symptoms increase: identifying high-risk substance using groups and the role of social media, parental supervision, and unsupervised time” (PI: Keyes)**

R01-DA048853

Role on project: Principal investigator

Dates of funding: 07/01/2019-06/30/2024

Funder: National Institute of Drug

Total annual direct and indirect costs: \$434,794

**“Age, period, and cohort effects on gender differences in alcohol use and alcohol-related problems in 47 national, longitudinally-followed cohorts” (PIs: Keyes and Jager)**

R01-AA026861

Role on project: Co-principal investigator and contact PI (Multiple PI with Justin Jager)

Dates of funding: 07/01/2018-06/30/2023

Funder: National Institute of Alcohol Abuse and Alcoholism

Total annual direct and indirect costs: \$529,899

**“Diverging trends between depression/suicidality and alcohol/opioid use among adolescents in the United States: Subgroup variation and the role of social media in 2 samples of adolescents” (PI: Keyes)**

R49 CE002096, subproject of CDC injury center resubmission

Role on project: Principal investigator

Dates of funding: 07/01/2019-06/30/2021

Funder: Centers for Disease Control and Prevention

Total direct and indirect costs: \$200,000

**“CHASE: an innovative county-level public health response to the opioid epidemic in New York State” (PIs: El-Bassel, Feaster, Gilbert, Nunes)**

UM1 DA049415

Role on project: Co-Investigator

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*Keyes Report*

Dates of funding: 04/17/2019-03/31/2023  
 Funder: National institute on Drug Abuse  
 Total direct and indirect costs: \$22,510,844

**“Columbia Injury Control Research Center” (PI: Branas)**  
 R49 CE002096

Role on project: Research Director  
 Dates of funding: 08/01/2019-07/31/2023  
 Funder: Centers for Disease Control and Prevention

**“Impact of medical and recreational marijuana laws on cannabis, opioids, and psychiatric medications: national study of VA patients, 2000-2024” (PI: Hasin)**

Role on project: Co-Investigator  
 Dates of funding: July 2019 – April 2024  
 Funder: National Institute on Drug Abuse (R01-DA048860)  
 Total direct and indirect costs: \$611,811

**“Examining the synergistic effects of cannabis and prescription opioid policies on chronic pain, opioid prescribing, and opioid overdose” (PI: Martins and Cerda)**

Role on project: Co-Investigator  
 Dates of funding: January 2019 – November 2023  
 Funder: National Institute on Drug Abuse (R01-DA045872)  
 Total direct and indirect costs: \$730,223

**“Drug use among nightclub and dance festival attendees in New York City” (PI: Palamar)**

Role on project: Co-Investigator, PI of Columbia subcontract  
 Dates of funding: 09/01/2018-05/31/2021  
 Funder: National Institute on Drug Abuse (R01-DA044207)  
 Total direct and indirect costs: \$497,339

**“Monitoring the Future: Drug Use and Lifestyles of American Youth” (PI: Miech)**

Role on project: Co-Investigator, PI of Columbia subcontract  
 Dates of funding: August 2017 – June 2022  
 Funder: National Institute on Drug Abuse (R01 DA001411)  
 Direct costs: \$5,123,733

**PAST SUPPORT**

**“Is social media affecting adolescent mental health? Piloting machine learning techniques to identify at-risk youth in national samples of adolescents from 2009 through 2018.”**

Role on the project: Principal Investigator  
 Funder: Columbia Population Research Center  
 Dates: May 2019-May 2020  
 Total direct costs: \$15,000

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1688. TRUM004687443  
 1689. TRUM004698410  
 1690. TRUM004698417  
 1691. TRUM004707667  
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 1685. TRUM004687437  
 1686. TRUM004687440  
 1687. TRUM004687441

Exh. B-75

*Keyes Report***“Substance abuse history, mental health and firearm violence: from evidence to action” (PI: Keyes and Cerda)**

Role on project: Principal investigator and Contact PI (Multiple PI with Magdalena Cerda)

Dates of funding: June 2015 – May 2019

Funder: National Institute of Alcohol Abuse and Alcoholism (R21 DA041154)

Direct costs: \$275,000

**“Race, alcohol consumption, and vehicle crashes: an epidemiologic paradox” (PI: Keyes)**

Role on project: Principal investigator

Dates of funding: June 2013 – May 2019

Funder: National Institute of Alcohol Abuse and Alcoholism (K01AA021511)

Direct costs: \$849,849

**“Aging well with alcohol? Harnessing longitudinal data from 20 countries to understand health impacts of moderate drinking among older adults” (PI: Keyes)**

Role on project: Principal investigator

Dates of funding: June 2017 – May 2019

Funder: The Robert N. Butler Columbia Aging Center

Direct costs: \$30,000

**“State medical marijuana laws and NSDUH marijuana use and consequences since 2004” (PI: Martins)**

Role on project: Co-Investigator

Dates of funding: August 2013 – December 2018

Funder: National Institute on Drug Abuse (R01 DA037866)

Direct costs: \$ 750,000

**“State medical marijuana laws and teen marijuana use and attitudes since 1991” (PI: Hasin)**

Role on project: Co-Investigator, PI of Columbia subcontract

Dates of funding: August 2012 – July 2017

Funder: National Institute on Drug Abuse (R01 DA034244)

Direct costs: \$ 374,562

**“Neighborhood interventions in alcohol-related homicide: a systems approach” (MPI: Keyes and Cerda)**

Role on project: Principal investigator and Contact PI (Multiple PI with Magdalena Cerda)

Dates of funding: October 2013-September 2016

Funder: National Institute of Alcohol Abuse and Alcoholism (R21 AA021909)

Direct costs: \$275,000

Exh. A-9

*Keyes Report***“Racial/Ethnic Disparity in Alcohol-Attributable Mortality from Motor Vehicle Crashes”**

Role on project: Principal investigator (PI)

Dates of funding: January 2016 – December 2016

Funder: Columbia University Center for Injury Epidemiology and Prevention

Direct costs: \$10,000

**“Correcting nonresponse bias in national surveys”**

Role on project: Principal investigator

Dates of funding: November 2015–October 2016

Funder: Columbia University Calderone Junior Faculty Prize

Direct costs: \$25,000

**“Principles of Epidemiology: a flipped classroom proposal”**

Role on the project: Principal Investigator (Multiple PI with Silvia Martins)

Dates of funding: May 2015 to May 2016

Funder: Columbia University Provost Hybrid Learning Course Redesign and Delivery program

Direct costs: \$12,000

**“Mental health and firearm violence: from evidence to action (MPI: Keyes and Cerda)”**

Role on project: Principal investigator (Multiple PI with Magdalena Cerda)

Dates of funding: January 2015 – December 2015

Funder: Columbia University Center for Injury Epidemiology and Prevention

Direct costs: \$10,000

**“Developing a translational framework for studying grief and grief-related pathologies”**

Role on the project: Co-Investigator (PI: Zoe Donaldson)

Dates of funding: May 2015 – September 2015

Funder: Columbia University Collaborative and Multidisciplinary Pilot Research Awards

Direct costs: \$15,000

**“Does structural discrimination explain health disparities by race? Preliminary analyses in state-to-state mobility” (PI: Keyes)**

Role on project: Principal investigator

Dates of funding: December 2012 – June 2013

Funder: Robert Wood Johnson Health & Society Scholars Program at Columbia University

Direct costs: \$5,000.00

**Research Associate Award: “The longitudinal emergence of racial/ethnic differences in alcohol use disorders and depression from adolescence to adulthood” (PI: Keyes)***Keyes Report*

1626. TRUM004593846

1627. TRUM004594955

1628. TRUM004595047

1629. TRUM004595049

1630. TRUM004595073

1631. TRUM004595421

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1640. TRUM004597364

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1656. TRUM004608700

Exh. A-10

Exh. B-74

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1595. TRUM003646878  
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 1622. TRUM004592729  
 1623. TRUM004592755  
 1624. TRUM004593809  
 1625. TRUM004593810

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Role on project: Principal Investigator  
 Dates of funding: September 2011 – June 2012  
 Funder: Columbia University  
 Direct costs: \$30,000.00.

**“Period and cohort effects in adolescent substance use: testing the effects of the social environment in a time series of U.S. adolescents from 1976-2008” (PI: Keyes)**

Role on project: Principal Investigator  
 Dates of funding: December 2010 – June 2011  
 Funder: Robert Wood Johnson Health & Society Scholars Program at Columbia University  
 Direct costs: \$10,000.00

**“Age-period-cohort effects on substance use in adolescence, 1976-2006” (PI: Keyes)**

Role on project: Principal Investigator  
 Dates of funding: June 2009 – October 2011 (electively terminated June 2010 due to early graduation)  
 Funder: National Institute on Drug Abuse (F31 DA026689-01)

**Educational Contributions**

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**DIRECT TEACHING/PRECEPTING/SUPERVISING**

Current courses

- EPID P8410: Psychiatric Epidemiology, 2016-2020
- EPIC Summer Institute: Principles of Epidemiology, 2014-2020

Former courses:

*Role: Instructor*

- EPID 787: Multi-level analysis for public health research, 2015-2020 (University of Michigan Graduate Summer Session in Epidemiology)
- EPIC Summer Institute: Multi-level analysis for public health research, 2016-2019
- HPMN P8545: Analysis of Large-Scale Data, 2016-2019
- Special short course: Multi-level analysis for public health research, 2017, (University of Cape Town, Cape Town, South Africa)
- EPID P6400: Principles of Epidemiology, 2010- 2015
- EPIC Summer Institute: Analysis of Complex Survey Data, 2011-2013
- MSPH Core: Quantitative Foundations of Public Health, 2012

*Role: Assistant Course Director*

- EPID P6400: Principles of Epidemiology, 2008, 2009

*Role: Guest lecturer*

- Health as a System, Columbia University School of Engineering and Applied Sciences, 2020

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- K Award Seminar Series, New York State Psychiatric Institute, 2013-2020
- EPID P9489: Advanced Techniques in Epidemiological Methods, 2017
- MPH Core Module 202-206: Principles of Epidemiology, (École des hautes études en santé publique, Paris, France), 2011-2016
- EPID P8416: Selected Problems in Measurement, 2010-2016
- EPID P8438: Design and Conduct of Observational Epidemiology, 2012-2015
- EPID P8419: Reading Seminar in Psychiatric Epidemiology, 2009-2015
- EPID P8470: Epidemiology of Alcohol and Drug Problems, 2011-2015
- EPID P9419: Master's Essay in Epidemiology, 2008-2015
- EPID P8471: Social Epidemiology, 2010

*Role: Teaching assistant*

- EPID P6400: Principles of Epidemiology, 2006-2008
- EPID P8421: Introduction to Clinical Psychiatry for Public Health, 2006
- EPID P8471: Social Epidemiology, 2008
- EPID P8419: Reading Seminar in Psychiatric Epidemiology, 2009
- EPID P8470: Epidemiology of Alcohol and Drug Problems, 2010

## ADVISING AND MENTORSHIP

## Master's students:

- Mary Elizabeth Smith, 2011 (thesis, second reader)
- Pedro Carneiro, 2012 (thesis, second reader)
- Bryan Kutner, 2012 (thesis, second reader)
- Erin Gilbert, 2012 (thesis, second reader)
- Xinfan Liu, 2012 (thesis, second reader)
- Charissa Pratt, 2013 (thesis, first reader)
- Arti Virkud, 2013 (thesis, first reader)
- Jonathan Platt, 2013 (thesis, first reader)
- Edward Gastel, 2013 (thesis, first reader)
- Nathalie DuRivage, 2013 (thesis, first reader)
- Thomas Vo, 2014 (thesis, first reader)
- Mark Morgan, 2014 (thesis, first reader)
- Sabrina Cheng, 2014 (thesis, first reader)
- Stephanie Brazis, 2014 (thesis, first reader)
- Ruth Chang, 2014 (thesis, first reader)
- Amy Lanza, 2015 (thesis, first reader)
- David Sowa, 2015 (thesis, first reader)
- Chidinma Egbukichi, 2015 (thesis, first reader)
- Khudejha Asghar, 2015 (thesis, first reader)
- Dahsan Gary, 2016 (thesis, first reader)
- Joy Ukaigwe, 2016 (thesis, first reader)
- Elizabeth Wartella, 2016 (thesis, first reader)
- Rachel Webster, 2016 (thesis, first reader)
- Caroline Hugh, 2017 (thesis, first reader)
- Ghadah Gadi, 2017 (thesis, first reader)
- Margaret Havunjian, 2018 (thesis, first reader)

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*Keyes Report*

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Exh. B-72

*Keyes Report*

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*Keyes Report*

Miriam Woodward, 2018 (thesis, first reader)  
 Ian Rodgers, 2018 (thesis, first reader)  
 Tatini Mal-Sarkar, expected 2019 (thesis, first reader)  
 \* Sidney Kark Award for Excellence in Global Epidemiology  
 Noah Kreski, 2019 (thesis, first reader)  
 Mia Pandit, 2019 (thesis, first reader)  
 Catherine Gimbrone, 2019 (thesis, first reader)  
 \* Abstract selected for oral presentation on Epi Masters Student Day  
 Alicia Singham Goodwin, 2020 (thesis, first reader)  
 Pallavi Krishnamurthy, 2020 (thesis, first reader)

## Doctoral students (former):

Joanne Brady, 2013-2014 (dissertation, second reader)  
 • Currently: senior research fellow, NORC at the University of Chicago  
 Melissa Dupont-Reyes, 2015-2017 (dissertation, second reader)  
 • Currently: Assistant Professor, University of Texas at Austin  
 Nina Banerjee, 2014-present (dissertation, second reader)  
 • Currently: psychologist in private practice, Orange County, CA  
 Julian Santaella, 2015-2018 (dissertation, sponsor)  
 • Currently: faculty, Universidad del Valle, Colombia  
 \* Awarded the William Farr Award for Social Epidemiology for dissertation work, 2019  
 Jonathan Platt, 2015-2019 (dissertation, sponsor)  
 • Currently: post-doctoral scholar, Department of Epidemiology, Columbia University  
 \* Awarded the William Farr Award for Social Epidemiology for dissertation work, 2019  
 Eleanor Hayes-Larson, 2018-2019  
 • Currently: post-doctoral scholar, Department of Epidemiology, University of California Los Angeles  
 \* Awarded the Anna C. Gelman Award for Excellence in Epidemiology for dissertation work, 2019  
 Somjen Frazer, 2015-2019  
 Currently: President and principal consultant, Strength in Numbers Consulting Group  
 Paula Bordelois, 2015-2019  
 Aravind Pillai, 2016-2020  
 Currently: Epidemiology, Kentucky Department of Public Health  
 Greg Cohen, 2018-present (dissertation, chair)  
 Currently: Post-doctoral research fellow, Boston University  
 Victor Puac-Polanco, 2018-present (dissertation, chair)  
 Currently: Post-doctoral research fellow, Harvard University  
 David Fink, 2015-present (dissertation, second reader)  
 Currently: Post-doctoral research fellow, Columbia University  
 Jonathan Pamplin, 2018-present (dissertation, chair)  
 Currently: Post-doctoral research fellow, New York University

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*Keyes Report*

## Doctoral students (present):

Andrew Ratanatharathorn, 2018-present (dissertation, second reader)  
 Precious Esie, 2020-present (dissertation, second reader)  
 Alex Perlmutter, 2020-present (dissertation, second reader)  
 Sandhya Kajcepeta, 2021-present (dissertation, second reader)  
 Sarah McKetta, 2019-present (dissertation, sponsor)  
 Deborah Huang, 2019-present (dissertation, sponsor)  
 Michelle Nolan, 2019-present (dissertation, sponsor)  
 Alexandra Restrepo Henao, 2019-present (dissertation, sponsor)  
 Shadiya Moss, 2019-present (dissertation, sponsor)  
 Melanie Askari, 2020-present (dissertation, sponsor)  
 Gonzalo Martinez-Ales, 2020-present (dissertation, chair)

## Discussant for dissertation proposal defense:

Wendy Cheng, 2014  
 Kate Sapra, 2014  
 Emily Greene, 2016  
 Anton Palma, 2019  
 Adriana Maldonado, 2019  
 Byoungjun Kim, 2021

## EDUCATIONAL ADMINISTRATION AND LEADERSHIP

- Director, Psychiatric Epidemiology Training Program, 2020-present
  - Directly responsible for administration of NIMH-funded T32 training program, which provides funding and training for four pre-doctoral students and three post-doctoral students. Provided advising to students, administration of program structure and content, coordination with co-directors on weekly seminar and field placements for students.
- Director, Executive MS in Epidemiology Program, 2012-2015
  - Directly responsible for administration of the program, including designing the coursework and program, overseeing instructors, overseeing admissions process, advising students. Contact hours were 10 hours per week.

## TRAINING PROGRAM INVOLVEMENT

- T32 MH013043-45 “A Research Training Program in Psychiatric Epidemiology”  
 Role: Director (with Ezra Susser, Bruce Dohrenwend, and Sharon Schwartz)
- T32 DA-031099-05 “Epidemiology of Substance Use Disorders Training Program at Columbia University” (PI: Hasin)  
 Role: Faculty, Steering Committee
- T32 ES023772-02 “Training Program in Environmental Life Course Epidemiology” (PI: Factor-Litvak)

Exh. A-14

*Keyes Report*

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 1501. SUFFOLK02723463

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*Keyes Report*

Role: Faculty

**Publications**

PEER-REVIEWED RESEARCH PUBLICATIONS IN PRINT OR OTHER MEDIA

+ mentee

\* senior author

1. +Martinez-Alex G, +Pamplin JR, +Rutherford C, +Gimbrone C, Kandula S, Olfson M, Gould MS, Shaman J, \***Keyes KM**. 2021. Age, period, and cohort effects on suicide death in the United States from 2009 to 2018: moderation by sex, race, and firearm involvement. *Molecular Psychiatry*, ePub April 7. PMID: 33828236.
2. +Pillai A, **Keyes KM**, Susser E. 2021. Antidepressant prescriptions and adherence in primary care in India: Insights from a cluster randomized control trial. *PLoS One*, March 19;16(3). PMID 33739982.
3. **Keyes KM**, Kandula S, Olfson M, Gould MS, +Martinez-Alex G, +Rutherford C, Shaman J. 2021. Suicide and the agent-host-environment triad: leveraging surveillance sources to inform prevention. *Psychological Medicine*, ePub March 5. PMID: 33663629.
4. +Kajeepta S, Mauro PM, **Keyes KM**, El-Sayed AM, Rutherford CG, Prins SJ. 2021. Association between county jail incarceration and cause-specific county mortality in the USA, 1987-2017: a retrospective, longitudinal study. *Lancet Public Health*, ePub February 23. PMID: 33636104.
5. Adams RS, +Jiang T, Rosellini AJ, Horvath-Puho E, Street AE, **Keyes KM**, Cerda M, Lash TL, Sorensen HT, Gradus JL. 2021. Sex-specific risk profiles for suicide among persons with substance use disorders in Denmark. *Addiction*, ePub Feb 23. PMID: 33620758
6. Palamar JJ, Fitzgerald ND, **Keyes KM**, Cottler LB. 2021. Drug checking at dance festivals: A review with recommendations to increase generalizability of findings. *Experimental and Clinical Psychopharmacology*, ePub Feb 18. PMID: 33600199.
7. +McKetta S, Morrison C, \***Keyes KM**. 2021. Trends in US Alcohol Consumption Frequency during the First Wave of the SARS-CoV-2 Pandemic. *Alcoholism: Clinical and Experimental Research*, ePub Feb 15. PMID: 33587290.
8. Beaulieu E, DiGennaro C, Stringfellow E, Connolly A, Hamilton A, Hyder A, Cerda M, **Keyes KM**, Jalai MS. 2021. Economic evaluation in opioid modeling: systematic review. *Feb;24(12):158-173*. PMID: 33518022.
9. +Chan CS, Sarvet SL, Basu A, Koenen K, \***Keyes KM**. 2021. Associations of intimate partner violence and financial adversity with familial homelessness in pregnant and postpartum women: A 7-year prospective study of the ALSPAC cohort. *PLoS One*, Jan 15;16(1). PMID: 33449965.
10. Jager J, \***Keyes KM**. 2021. Is substance use changing because of the COVID-19 pandemic? Conceptual and methodological considerations to delineating the impact of the Covid-19 pandemic on substance use and disorder. *Addiction*, ePub Jan 15. PMID: 33449443.

Exh. A-15

*Keyes Report*

11. +Platt JM, Bates L, Jager J, McLaughlin KA, \***Keyes KM**. 2021. Is the US Gender Gap in Depression Changing Over Time? A Meta-Regression. American Journal of Epidemiology. ePub Jan 11. PMID: 33423055.
12. +Puac-Polanco V, **Keyes KM**, Mauro PM, Branas CC. 2020. A systematic review of drink specials, drink special laws, and alcohol-related outcomes. Current Epidemiology Reports. 7(4):300-314. PMID: 33364145.
13. Linas BP, Savinkina A, Barbosa C, Mueller PP, Cerda M, **Keyes KM**, Chhatwal J. 2021. A clash of epidemics: impact of COVID-19 pandemic response on opioid overdose. Journal of Substance Abuse Treatment. ePub Jan;120:108158. PMID: 33298298.
14. +Shimonovich M, Pearce A, Thomson H, **Keyes KM**, Katikireddi SV. 2020. Assessing causality in epidemiology: revisiting Bradford Hill to incorporate developments in causal thinking. European Journal of Epidemiology. ePub December 16. PMID: 33324996.
15. +Grummitt LR, Kelly EV, Barrett EL, **Keyes KM**, Newton NC. 2020. Identifying targets for substance use prevention in youth people exposed to childhood adversity: protocol for a systematic review. JMIR Research Protocols. Dec 4;9(12):e22368. PMID: 33275102.
16. Cerda M, Krawczyk N, Hamilton L, Rudolph KE, Friedman SR. \***Keyes KM**. 2020. A Critical Review of the Social and Behavioral Contributions to the Overdose Epidemic. Annual Review of Public Health. Nov 30. PMID: 33256535.
17. Prins SJ, +McKetta S, +Platt J, Muntaner C, **Keyes KM**, Bates LM. 2020. "The Serpent of their Agonies": Exploitation As Structural Determinant of Mental Illness. Epidemiology. Nov 25<sup>th</sup>. PMID: 33252438.
18. HEALing Communities Study Consortium. 2020. The HEALing (Helping to End Addiction Long-term) Communities Study: Protocol for a cluster randomized trial at the community level to reduce opioid overdose deaths through implementation of an integrated set of evidence-based practices. Drug and Alcohol Dependence. ePub Oct 17. PMID: 33248391.
19. Calvo E, Allel K, Staudinger UM, Castillo-Carniglia A, Medina JT, \***Keyes KM**. 2020. Cross-country differences in age trends in alcohol consumption among older adults: a cross-sectional study of individuals aged 50 years and older in 22 countries. Addiction. ePub Nov 25. PMID: 33241648.
20. Abdalla SM, **Keyes KM**, Galea S. 2020. A public health approach to tackling the role of culture in shaping the gun violence epidemic in the United States. Public Health Reports. ePub October 27. PMID: 33130532.
21. +Kaur N, **Keyes KM**, +Hamilton AD, Chapman C, Livingston M, Slade T, Swift W. 2020. Trends in cannabis use and attitudes toward legalization and use among Australians from 2001-2016: an age-period-cohort analysis. Addiction. ePub Sep 19. PMID: 32949418.
22. Zafari Z, **Keyes KM**, Jiao B, Williams SZ, Muennig PA. 2020. Differences between black and whites in well-being, beliefs, emotional states, behaviors, and survival: 1978-2014. PLoS One. Sept 14;15(9). PMID: 32925952.
23. Masfety VK, +Woodward MJ, **Keyes KM**, Bitfoi A, Carta MG, Koc C, Lesinskiene S, Mihova Z, Otten R, Husky M. 2020. Gender, the gender gap, and their interaction: analysis of relationships with children's mental health problems.

Exh. A-16

*Keyes Report*

1440. SUFFOLK02723341
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Exh. B-68

*Keyes Report*

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Exh. B-67

*Keyes Report*

- Social Psychiatry and Psychiatric Epidemiology, ePub September 10. PMID: 32914299.
24. Meinhofer A, Onuoha E, Anglero-Diaz Y, \***Keyes KM**. 2020. Parental drug use and racial and ethnic disproportionality in the U.S. foster care system. Child Youth Serv Rev. Nov,118:105336. PMID: 32863501.
  25. +Martinez-Ales G, Hernandez-Calle D, Khauli N, \***Keyes KM**. 2020. Why Are Suicide Rates Increasing in the United States? Towards a Multilevel Reimagination of Suicide Prevention. Curr Top Behav Neurosci, ePub Aug 30. PMID: 32860592.
  26. +Kreski N, +Platt J, +Rutherford C, Olsson M, Odgers C, Schulenberg J, \***Keyes KM**. 2020. Social media use and depressive symptoms among United States adolescents. Journal of Adolescent Health, ePub Aug 11. PMID: 32798102.
  27. Calvo E, Medina JT, Ornstein KA, Staudinger UM, Fried LP, \***Keyes KM**. 2020. Cross-country and historical variation in alcohol consumption among older men and women: leveraging recently harmonized survey data in 21 countries. Drug and Alcohol Dependence, ePub Aug 4. PMID 32795884.
  28. +Richardson RA, **Keyes KM**, Medina JT, Calvo E. 2020. Sociodemographic inequalities in depression among older adults: cross-sectional evidence from 18 countries. Lancet Psychiatry, 7(8):673-681. PMID: 32711708.
  29. **Keyes KM**, Jager J, +Platt J, +Rutherford C, Patrick ME, Kloska DD, Schulenberg J. 2020. When does attrition lead to biased estimates of alcohol consumption? Bias analysis for loss to follow-up in 30 longitudinal cohorts. International Journal of Methods in Psychiatric Research. ePub July 13<sup>th</sup>. PMID: 32656917.
  30. +Santaella-Tenorio J, Martins SS, Cerda M, Olsson M, \***Keyes KM**. 2020. Suicidal ideation and attempts following nonmedical use of prescription opioids and related disorder. Psychological Medicine, ePub July 8. PMID: 32635959.
  31. +Kaur N, +Rutherford CG, Martins SS, \***Keyes KM**. 2020. Associations between digital technology and substance use among US adolescents: Results from the 2018 Monitoring the Future survey. Drug and Alcohol Dependence, ePub Jun 18. PMID: 32590211.
  32. +Santaella-Tenorio J, Wheeler-Martin K, DiMaggio CJ, Castillo-Carniglia A, **Keyes KM**, Hasin D, Cerda M. 2020. Association of Recreational Cannabis Laws in Colorado and Washington State With Changes in Traffic Fatalities, 2005-2017. JAMA Internal Medicine, ePub June 22. PMID: 32568378.
  33. +Platt JM, Bates LM, Jager J, McLaughlin KA, \***Keyes KM**. 2020. Changes in the depression gender gap from 1992 to 2014: Cohort effects and mediation by gendered social position. Social Science and Medicine, ePub May 30. PMID: 32540513.
  34. Palamar JJ, Han BH, \***Keyes KM**. 2020. Trends in characteristics of individuals who use methamphetamine in the United States, 2015-2018. Drug and Alcohol Dependence, ePub June 3. PMID: 32531703.
  35. Castillo-Carniglia A, Rivera-Aguirre A, Calvo E, Queirolo R, **Keyes KM**, Cerda M. 2020. Trends in marijuana use in two Latin American countries: an age, period, and cohort study. Addiction, ePub March 20. PMID 32196789.

Exh. A-17

*Keyes Report*

36. Puac-Polanco V, Chihuri S, Fink DS, Cerda M, **Keyes KM**, Li G. 2020. Prescription Drug Monitoring Programs and Prescription Opioid-Related Outcomes in the United States. Epidemiology Reviews, ePub April 3. PMID: 32242239.
37. Morrison CN, Mehranbod C, Kwizera M, Rundle AG, **Keyes KM**, Humphreys DK. 2020. Ridesharing and motor vehicle crashes: a spatial ecological case-crossover study of trip-level data. Injury Prevention, ePub Apr 6. PMID: 32253258.
38. Margolis AE, Broitman J, Davis JM, Alexander L, Hamilton A, Liao Z, Banker S, Thomas L, Ramphal B, Salum GA, Merikangas K, Goldsmith J, Paus T, **Keyes KM**, Milham MP. 2020. Estimated Prevalence of Nonverbal Learning Disability Among North American Children and Adolescents. JAMA Netw Open, ePub Apr 1. PMID: 32275324.
39. +McKetta SC, \***Keyes KM**. 2020. Trends in U.S. women's binge drinking in middle adulthood by socioeconomic status, 2006-2018. Drug and Alcohol Dependence, ePub Apr 28. PMID: 32408139.
40. Palamar JJ, \***Keyes KM**. 2020. Trends in drug use among electronic dance music party attendees in New York City, 2016-2019. Drug and Alcohol Dependence, ePub Feb 5<sup>th</sup>. PMID: 32050110.
41. Lau B, Duggal P, Ehrhardt S, Armenian H, Branas CC, Colditz GA, Fox MP, Hawes SE, He J, Hofman A, **Keyes KM**, Ko AI, Lash TL, Levy D, Lu M, Morabia A, Ness R, Nieto FJ, Schisterman EF, Strumer T, Szklo M, Werler M, Wilcox AJ, Celentano DD. 2020. Perspectives on the Future of Epidemiology: a Framework for Training. American Journal of Epidemiology, ePub Jan 31. PMID: 32003778.
42. Palamar JJ, Salomone A, +Rutherford C, \***Keyes KM**. 2020. Extensive Underreported Exposure to Ketamine Among Electronic Dance Music Party Attendees. J Gen Intern Medicine, ePub Jan 29. PMID: 31997140.
43. +Kajcepet S, +Rutherford CG, **Keyes KM**, El-Sayed AM, Prins SJ. 2020. County Jail Incarceration Rates and County Mortality Rates in the United States, 1987-2016. American Journal of Public Health, Jan110(S1):S109-S115. PMID: 31967885.
44. Hasin DS, Shmulewitz D, Cerda M, **Keyes KM**, Olfson M, Sarvet AL, Wall MM. 2020. U.S. Adults With Pain, A Group Increasingly Vulnerable to Nonmedical Cannabis Use and Cannabis Use Disorder: 2001-2002 and 2012-2013. American Journal of Psychiatry, ePub Jan 22. PMID: 31964162.
45. Miech R, **Keyes KM**, O'Malley PM, Johnston LD. 2020. The great decline in adolescent cigarette smoking since 2000: consequences for drug use among US adolescents. Tobacco Control, ePub Jan 15. PMID 31941823.
46. +Platt JM, **Keyes KM**, McLaughlin KA, Kaufman AS. 2019. The Flynn effect for fluid IQ may not generalize to all ages or ability levels: a population-based study of 10,000 US adolescents. Intelligence, Vol 77. PMID: 32322129.
47. Kagawa R, Pear VA, Rudolph KE, **Keyes KM**, Cerda M, Wintemute GJ. 2019. Distress level and daily functioning problems attributed to firearm victimization: Sociodemographic specific responses. Annals of Epidemiology. ePub Dec 6. PMID: TBD.

Exh. A-18

*Keyes Report*

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1316. SUFFOLK02722411
1317. SUFFOLK02722425
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Exh. B-64

*Keyes Report*

1285. SUFFOLK01988775  
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 1313. SUFFOLK02722374  
 1314. SUFFOLK02722383  
 1315. SUFFOLK02722397

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1254. SUFFOLK00881516
1255. SUFFOLK00883926
1256. SUFFOLK00887154
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1282. SUFFOLK01404925
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1284. SUFFOLK01928414

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*Keyes Report*

1223. SUFFOLK00347876  
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 1253. SUFFOLK00879600

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1193. NYAG02017451
1194. NYAG02017589
1195. NYAG02017728
1196. NYAG02017865
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1220. SUFFOLK00347837
1221. SUFFOLK00347842
1222. SUFFOLK00347871

Exh. B-60

*Keyes Report*

1161. NYAG02016806  
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 1189. NYAG02017036  
 1190. NYAG02017037  
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Exh. B-58

*Keyes Report*

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 1128. NYAG01578191  
 1129. NYAG01578192

Exh. B-57

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1069. LAKE005138543
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Exh. B-56

*Keyes Report*

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Exh. A-30

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1030. LAKE002734270
1031. LAKE002736803
1032. LAKE002819097
1033. LAKE002860097
1034. LAKE003921585
1035. LAKE003977670
1036. LAKE003980281

Exh. B-54

*Keyes Report*

975. LAKE002351784  
 976. LAKE002351977  
 977. LAKE002351981  
 978. LAKE002352332  
 979. LAKE002352538  
 980. LAKE002353497  
 981. LAKE002353606  
 982. LAKE002353610  
 983. LAKE002354042  
 984. LAKE002354148  
 985. LAKE002354211  
 986. LAKE002354430  
 987. LAKE002354435  
 988. LAKE002354790  
 989. LAKE002354802  
 990. LAKE002356118  
 991. LAKE002356415  
 992. LAKE002356416  
 993. LAKE002356425  
 994. LAKE002356426  
 995. LAKE002356493  
 996. LAKE002356500  
 997. LAKE002356564  
 998. LAKE002356567  
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 1001. LAKE002357519  
 1002. LAKE002357524  
 1003. LAKE002357545  
 1004. LAKE002357631  
 1005. LAKE002357637

Exh. B-53

*Keyes Report*

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*Keyes Report*

944. LAKE000003685
945. LAKE000003686
946. LAKE000003687
947. LAKE000009107
948. LAKE000047019
949. LAKE000057535
950. LAKE000065119
951. LAKE000065139
952. LAKE000082146
953. LAKE000082147
954. LAKE000082171
955. LAKE000082172
956. LAKE000102767
957. LAKE000102792
958. LAKE000339022
959. LAKE000348296
960. LAKE000367655
961. LAKE001151355
962. LAKE00151355
963. LAKE002342073
964. LAKE002342077
965. LAKE002342304
966. LAKE002342415
967. LAKE002343560
968. LAKE002343829
969. LAKE002346044
970. LAKE002346045
971. LAKE002346224
972. LAKE002346226
973. LAKE002350330
974. LAKE002351098

Exh. B-52

*Keyes Report*

913. HUNT\_00061244  
 914. HUNT\_00061307  
 915. HUNT\_00061433  
 916. HUNT\_00061434  
 917. HUNT\_00063582  
 918. HUNT\_00068488  
 919. HUNT\_00074829  
 920. HUNT\_00078524  
 921. HUNT\_00080816  
 922. HUNT\_00081484  
 923. HUNT\_00085831  
 924. HUNT\_00089822  
 925. HUNT\_00094258  
 926. HUNT\_00094259  
 927. HUNT\_00095511  
 928. HUNT\_00096300  
 929. HUNT\_00099227  
 930. HUNT\_00103403  
 931. HUNT\_00224613  
 932. HUNT\_00224690  
 933. HUNT\_00225171  
 934. HUNT\_00321072  
 935. HUNT\_00321073  
 936. HUNT\_01682433  
 937. HUNT\_01682433  
 938. HUNT\_ESI\_REV\_001751284  
 939. LAKE0000002371  
 940. LAKE0000002387  
 941. LAKE0000002403  
 942. LAKE0000003673  
 943. LAKE0000003679

Exh. B-51

*Keyes Report*

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Exh. A-33

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Exh. A-34

*Keyes Report*

882. CUYAH\_003505168
883. CUYAH\_013470168
884. CUYAH\_014207127
885. HUNT\_00009752
886. HUNT\_00009992
887. HUNT\_00010368
888. HUNT\_00027750
889. HUNT\_00028762
890. HUNT\_00028960
891. HUNT\_00028961
892. HUNT\_00029477
893. HUNT\_00030062
894. HUNT\_00030093
895. HUNT\_00030096
896. HUNT\_00030097
897. HUNT\_00030099
898. HUNT\_00030183
899. HUNT\_00030290
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901. HUNT\_00030366
902. HUNT\_00030411
903. HUNT\_00030412
904. HUNT\_00036558
905. HUNT\_00042695
906. HUNT\_00043871
907. HUNT\_00047053
908. HUNT\_00047080
909. HUNT\_00053204
910. HUNT\_00053205
911. HUNT\_00053206
912. HUNT\_00060305

Exh. B-50

*Keyes Report*

851. ADAMHS000005310  
 852. ADAMHS000005313  
 853. ADAMHS000005336  
 854. ADAMHS000005337  
 855. ADAMHS000005382  
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 857. ADAMHS000005384  
 858. ADAMHS000005569  
 859. ADAMHS000006266  
 860. ADAMHS000020606  
 861. ADAMHS000023766  
 862. ADAMHS000023769  
 863. ADAMHS000026036  
 864. CAH\_MDL\_PRIORPROD\_DEA12\_00004212  
 865. CAH\_MDL\_PRIORPROD\_DEA12\_00013049  
 866. CAH\_MDL2804\_02465982  
 867. CHHD\_0000871  
 868. CHHD\_0055465  
 869. CHHD\_0061559  
 870. CHHD\_0075557  
 871. CUYAH\_000010424  
 872. CUYAH\_000017387  
 873. CUYAH\_000018356  
 874. CUYAH\_000018510  
 875. CUYAH\_000018578  
 876. CUYAH\_002147343  
 877. CUYAH\_002148949  
 878. CUYAH\_002351018  
 879. CUYAH\_002472581  
 880. CUYAH\_002486141  
 881. CUYAH\_003468436

Exh. B-49

*Keyes Report*

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Exh. A-35

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Exh. A-36

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820. ADAMHS000001222
821. ADAMHS000001303
822. ADAMHS000001498
823. ADAMHS000001813
824. ADAMHS000001956
825. ADAMHS000002103
826. ADAMHS000002205
827. ADAMHS000002206
828. ADAMHS000002300
829. ADAMHS000002320
830. ADAMHS000002437
831. ADAMHS000002598
832. ADAMHS000002638
833. ADAMHS000002728
834. ADAMHS000002770
835. ADAMHS000002870
836. ADAMHS000002944
837. ADAMHS000002947
838. ADAMHS000004728
839. ADAMHS000004753
840. ADAMHS000004851
841. ADAMHS000005037
842. ADAMHS000005038
843. ADAMHS000005039
844. ADAMHS000005040
845. ADAMHS000005041
846. ADAMHS000005132
847. ADAMHS000005133
848. ADAMHS000005134
849. ADAMHS000005258
850. ADAMHS000005308

Exh. B-48

*Keyes Report*

800. WV Overdoses 2001-2018 Selected Drugs
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2. The rapid decline in adolescent mental health in the 21<sup>st</sup> century: magnitude, causes, and treatment innovations from a life course perspective. Society for Epidemiologic Research, symposium chair, December 2020. Virtual.
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5. Family matters: using family designs to control confounding in observational studies. Society for Epidemiologic Research, symposium chair, June 2019, Minneapolis, MN.
6. Simulating firearm suicide based on gun ownership disqualifications: an agent-based modeling approach. Association for Psychological Science, symposium presentation, May 2019, Washington, DC.
7. Rapid increases in depressive symptoms among US adolescents: 1991-2018. Society for the Advancement of Violence and Injury Research, symposium presentation, April 2019, Cincinnati, OH.
8. Declines in the relationship between adolescent depressive affect and binge drinking: implications for public mental health. Research Society on Alcoholism, symposium presentation, June 2018, San Diego, CA.
9. Psychiatric epidemiology in the era of precision medicine: what is our role? Symposium chair, Society for Epidemiologic Research, June 2017, Seattle, WA.
10. Fifty years of high impact epidemiological research on drug use disorders and related conditions: Looking back and ahead. Symposium presentation, Society for Epidemiologic Research, June 2017, Seattle, WA.
11. Agent-based model of alcohol taxation effects on violence and homicide in New York City. Symposium presentation, Research Society on Alcoholism, June 2016, New Orleans, LA.

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*Keyes Report*

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639. Richard Harruff and Julia Hood. Toward a Real-Time Drug Overdose Monitoring System. Public Health Seattle and King Counties (power point)
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*Keyes Report*

12. The impact of traumatic experiences across diverse populations: causes, consequences, and correlates. Symposium chair, Society for Epidemiologic Research, June 2016, Miami, FL.
13. Agent-Based models and the G-Formula: Comparable Approaches for Evaluating Population Intervention Effects? Symposium discussant, Society for Epidemiologic Research, June 2016, Miami, FL.
14. How similar are survey respondents to the general population? Symposium presentation, Society for Epidemiologic Research, June 2016, Miami, FL.
15. Mental Health and Aging: Chronic Disease, Cognition, and Pathways Connecting Mind and Body. Symposium chair, Society for Epidemiological Research, June 2015, Denver, CO.
16. Teaching epidemiology by building on foundational concepts. Symposium presentation, Society for Epidemiological Research, June 2015, Denver, CO.
17. The mathematical limits of genetic prediction for complex chronic disease. Symposium presentation, Society for Epidemiological Research, June 2015, Denver, CO.
18. Alcohol Interventions and Rates of Violence and Homicide in New York City: an Agent-Based Approach. Symposium presentation, Society for Epidemiological Research, June 2015, Denver, CO.
19. Racial/ethnic differences in alcohol use across the life course: an explanation of health disparities? International Epidemiological Association, August 2014, Anchorage, AL.
20. Health within and across generations: new research in life course epidemiology. Symposium chair, Society for Epidemiologic Research, June 2014, Seattle, WA.
21. How should we prioritize 'external validity' when aiming to conduct an epidemiology that matters? Symposium presentation, Society for Epidemiologic Research, June 2014, Seattle, WA.
22. Multi-national birth cohort trends in sensation seeking in the United States from 1976 to 2011. Symposium presentation, Society for Research on Adolescents, March 2014, Austin, TX.
23. Racial/ethnic differences in drinking in the US: paradoxes, problems, and research priorities. Research Society on Alcoholism, Symposium chair and presentation, June 2013, Orlando, FL.
24. The burden of loss: unexpected death and psychiatric disorders across the life course. International Society for Traumatic Stress Studies, Symposium presentation, November 2012, Los Angeles, CA.
25. The social norms of birth cohorts: age, period, and cohort effects in adolescent and adult binge drinking. Symposium presentation, Society for Research on Child Development, October 2012, Tampa, FL.
26. Thought disorders in the meta-structure of psychopathology. Symposium presentation, Research Society on Alcoholism, June 2012, San Francisco, CA.
27. Time Trends and Their Explanations. Symposium chair, Research Society on Alcoholism, June 2011, Atlanta, Georgia.
28. Novel Methods to Assess Societal-Level Causes of Alcohol Disorders Across Time and Place. Symposium chair, Research Society on Alcoholism, June 2010, San Antonio, Texas.

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29. A multi-level framework for understanding birth cohort effects. Symposium presentation, Research Society on Alcoholism, June 2010, San Antonio, Texas.
30. A Comprehensive Approach to Age-Period-Cohort Analysis. Plenary session presentation, Society for Epidemiologic Research, June 2008, Chicago, IL.
31. Economic capital and problem alcohol use: the positive relationship between income and the DSM-IV alcohol abuse diagnosis. Symposium presentation, Research Society on Alcoholism, July 2007, Chicago, IL.
32. Keyes KM, Hasin DS. Birth cohort effects on gender differences in the risk for drug dependence. College on Problems of Drug Dependence, July 2006, Scottsdale, AZ.  
\* Selected for Women & Gender Junior Investigator Award

*INTERNATIONAL*

1. War and Mental Health. World Psychiatric Association, March 2021, Bangkok, Thailand. Virtual.
2. Mental health and firearm violence: what role should disqualification criteria on firearm ownership play? Symposium presentation International Federation of Psychiatric Epidemiology, October 2017, Melbourne, Australia.
3. Mental health and firearm violence: Understanding social and environmental contexts on the path to prevention. Symposium chair, International Federation of Psychiatric Epidemiology, October 2017, Melbourne, Australia.
4. Transdiagnostic psychiatric disorder risk associated with early and late age of menarche: a latent modeling approach. Symposium presentation, International Federation of Psychiatric Epidemiology, October 2017, Melbourne, Australia.
5. Utilising epidemiology to guide innovative prevention for comorbid mental and substance use problems in young people. Symposium discussant, International Federation of Psychiatric Epidemiology, October 2017, Melbourne, Australia.
6. The influence of medical marijuana laws on adolescent and adult outcomes: current state evidence from the United States. Symposium presentation, World Psychiatric Association, October 2017, Berlin, Germany.
7. How healthy are survey respondents compared to the general population? A comparison of mortality rates from linked death records. Symposium presentation, World Psychiatric Association Epidemiology Section, April 2016, Munich, Germany.
8. Anxious and angry: course and comorbidity of intermittent explosive disorder and anxiety disorders in adolescence. Symposium presentation, International Federation of Psychiatric Epidemiology, October 2015, Bergen, Norway.
9. Trajectories of alcohol and cigarette use across the lifecourse: evidence from a pregnancy cohort. Symposium presentation, World Psychiatric Association, September 2014, Madrid, Spain.
10. Maternal alcohol consumption and offspring psychopathology. European Public Health Association Conference, Symposium presentation, November 2013, Brussels, Belgium.
11. Understanding the teenage brain in context: 35 years of adolescent sensation seeking in the United States. International Federation of Psychiatric Epidemiology, Symposium chair and presentation, June 2013, Leipzig, Germany.

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*Keyes Report*

609. Plaintiffs' Third Amended Complaint. *In re National Prescription Opiate Litigation*. 17-md-02804
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618. Prescription Drug Disposal Locations. Oct 25, 2019.
619. Prescription Drug Use and Misuse in the United States: Results from the 2015 National Survey on Drug Use and Health (NSDUH)
620. Proposed Opioid Response Plan for the State of West Virginia: Proposed Report for Public Comment January 10 2018
621. Public Children Services Association of Ohio. The Opioid Epidemic's Impact on Children Services in Ohio. PCSAO report on opioid epidemic's impact on children services in OH
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623. Putrich, G. BABY STEPS For drug-exposed infants, intensive care is too intense. *Nation & World*. Dec 22, 2017
624. R. Miech, et al., Prescription Opioids in Adolescence and Future Opioid Misuse, *Pediatrics*, Volume 136:e1169- 1177 (2015).
625. Rachel N. Lipari and Arthur Hughes. HOW PEOPLE OBTAIN THE PRESCRIPTION PAIN RELIEVERS THEY MISUSE. SAMHSA The CBHSQ Report

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591. Opioid Prevention Program: Data to Action Fentanyl-related deaths in New York State outside of New York City, 2015-2017 February 2019 ([https://www.health.ny.gov/statistics/opioid/data/pdf/nysdoh\\_dta1\\_fentanyl.pdf](https://www.health.ny.gov/statistics/opioid/data/pdf/nysdoh_dta1_fentanyl.pdf))
592. Order governing production and de-identification of certain medical and pharmacy information. Supreme Court of the State of New York, dkt no 1359 index no 400000/2017
593. O'Rourke, A. et al. Acceptability of safe drug consumption spaces among people who inject drugs in rural West Virginia. *Harm Reduction Journal* volume 16, Article number: 51 (2019)
594. OSAM Drug Abuse Trends in the Cleveland Region, Drug Trend Report. June 2018-Jan 2019
595. OUD Over Time Graph
596. OUD Population at a Glance
597. OUD Population at a Glance map 2
598. Overdose Death Rates. National Institute on Drug Abuse. <https://www.drugabuse.gov/related-topics/trends-statistics/overdose-death-rates>. Published 2019.
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607. Peiper NC, Clarke SD, Vincent LB, Ciccarone D, Kral AH, Zibbell JE. Fentanyl test strips as an opioid overdose prevention strategy: Findings from a syringe services program in the Southeastern United States. *Int J Drug Policy*. 2019. doi:10.1016/j.drugpo.2018.08.007
608. Physicians Assistants near Huntington, WV. Available at: <https://www.healthgrades.com/general-medicine-physicians-assistant-directory/wv-west-virginia/huntington>

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12. Comorbidity of less common psychiatric disorders in the meta-structure of psychopathology. Symposium presentation, *World Psychiatric Association*, October 2012, Prague, Czech Republic.
13. How can thought disorders be conceptualized in the meta-structure of psychopathology? Symposium presentation, *Life History Society*, October 2012, Surrey, England.
14. Understanding family-based designs using Directed Acyclic Graphs. Symposium presentation, *World Psychiatric Association Epidemiology Section*, March 2012, Sao Paulo, Brazil.
15. Childhood Maltreatment and the Structure of Common Psychiatric Disorders. Symposium presentation, *Society for Epidemiologic Research*, June 2011, Montreal, Canada.
16. Methodological issues in the assessment of adverse childhood events. Symposium chair, *Society for Epidemiologic Research*, June 2011, Montreal, Canada.
17. Time as a multi-level risk factor: the impact of time period- and birth cohort-specific social norms on adolescent marijuana use, 1976-2007. Symposium presentation, *École Des Hautes Études En Santé Publique*, January 2010, Paris, France.
18. Challenging the paradigm of a “telescoping” phenomenon in gender differences for substance disorders: results of a cohort analysis in the U.S. population. Symposium presentation, *International Federation of Psychiatric Epidemiology*, April 2009, Vienna, Austria.

## INVITED LECTURES

*REGIONAL*

1. Suicide and the agent-host-environment trial. Mailman School of Public Health, Spatial Epidemiology and the Science of Place in Shaping Health Equity series, March 2021, New York, NY. Virtual.
2. Age, period, and cohort effects: an introduction to conceptual and analytic issues. Mt Sinai Brookdale Department of Geriatrics and Palliative Medicine, January 2021, New York, NY. Virtual.
3. Trends in alcohol use in the 20<sup>th</sup> century: gender differences and implications for the decades to come. Columbia Liver Transplant Lunch & Learn. November, 2020, New York, NY. Virtual.
4. Using agent-based models to simulate the opioid epidemic: a critical review of the literature and proposed framework for New York State and beyond. *HIV Intervention Science Training Program for Underrepresented New Investigators*. August 2019, New York, NY.
5. Depression's got a hold of me: Gender differences and generational trends in alcohol use and mental health among US adolescents and adults. Substance Abuse Epidemiology Training Program seminar, Columbia University, October 2018, New York, NY.
6. Adolescent mental health and substance use in the 21<sup>st</sup> century: implications for research and prevention. *NIAAA Webinar: Women, Drinking, and Pregnancy Working group*. November 2018, Bethesda, MD.

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7. Depression's got a hold of me: Gender differences and generational trends in alcohol use and mental health among US adolescents and adults. Substance Abuse Epidemiology Training Program seminar, Columbia University, October 2018, New York, NY.
8. Depression's got a hold of me: Gender differences and generational trends in alcohol use and mental health among US adolescents and adults. Epidemiology and Biostatistics Seminar, Drexel University, November 2018, Philadelphia, PA.
9. Mental health over the life course: adolescence. National Academy of Sciences workshop: Women's Mental Health across the Life Course. March 7<sup>th</sup>, 2018. Washington DC.
10. Life Course Psychopathology: The Next Decade. American Psychopathological Association, invited talk, March 3<sup>rd</sup>, 2018. New York, NY.
11. As adolescent substance use declines, depression and suicidality increase: a tale across generations. NYU Population Health, Epidemiology Seminar Series. December 4<sup>th</sup>, 2017, New York, NY.
12. Historical and current trends in adolescent heavy alcohol use, depressive affect, and their relationship: implications for adolescent suicide in the United States. NIAAA Workshop to Explore Research Needs in Addressing Alcohol-Related Suicide, September 2017, National Institute of Alcohol Abuse and Alcoholism, Rockville, Maryland.
13. Alcohol use and morbidity across historical time: what does variation tell us about environmental determinants of alcohol-related outcomes? National Institute of Health Director's Wednesday Afternoon Lecture Series (WALS), May 2017, NIH, Bethesda, MD.
14. The role of epidemiology in population mental health in the 21<sup>st</sup> century: history, current progress, future directions. Population Health Research Seminar, October 2016, New York University, New York, NY.
15. How and why do psychiatric disorders change across time. Brain Health Colloquium, Harvard T.H. Chan School of Public Health, Seminar presentation, April 2016, Boston, MA.
16. The mathematical limits of genetic prediction for complex chronic disease. Symposium presentation, American Psychopathological Association, March 2016, New York, NY.
17. How and why do psychiatric disorders change across time. Institute for Translational Epidemiology, Mount Sinai School of Medicine, Seminar presentation, January 2016, New York, NY.
18. Psychiatric disorders among bereaved individuals. Grand Rounds speaker, Hartford Hospital Institute of Living, October 2014, Hartford, CT.
19. How can we intervene in neighborhoods to reduce racial/ethnic inequalities in alcohol-related homicide? Simulating in-silico counterfactuals. Partnership for a Healthier New York City, June 2014, New York, NY.
20. How can we intervene in neighborhoods to reduce racial/ethnic inequalities in alcohol-related homicide? Simulating in-silico counterfactuals. Innovations in Translating Injury Research Into Effective Prevention, May 2014, New York, NY.

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574. NOWS Research
575. Number and Age-Adjusted Rates of Drug-Poisoning Deaths Involving Opioid Analgesics and Heroin: United States, 1999–2014.; 2015. [https://www.cdc.gov/nchs/data/health\\_policy/AADR\\_drug\\_poisoning\\_involving\\_OA\\_Heroin\\_US\\_2000-2014.pdf](https://www.cdc.gov/nchs/data/health_policy/AADR_drug_poisoning_involving_OA_Heroin_US_2000-2014.pdf).
576. Number of infant drug addiction cases in WV isn't decreasing. [https://www.herald-dispatch.com/news/number-of-infant-drug-addiction-cases-in-wv-isn-t/article\\_36bc2f96-3e01-11e8-8514-436d43c1dbf6.html](https://www.herald-dispatch.com/news/number-of-infant-drug-addiction-cases-in-wv-isn-t/article_36bc2f96-3e01-11e8-8514-436d43c1dbf6.html)
577. NYS Annual Reports <https://www.health.ny.gov/statistics/diseases/communicable/index.htm>
578. NYS DOH Communicable Disease Annual Reports and Related Information <https://www.health.ny.gov/statistics/diseases/communicable/index.htm>
579. NYS Health Foundation. Follow the Money: Pharmaceutical Manufacturer Payments and Opioid Prescribing Patterns in New York State. NYS Health Foundation
580. O'Brien C. Addiction and dependence in DSM-V. *Addiction*. 2011;106(5):866-867. doi:10.1111/j.1360-0443.2010.03144.x
581. O'Connell, L. Channel Anger Into Action. LinkedIn. Sept. 19,2016
582. ODD\_Marshall Dashboard
583. Office of Drug Control Policy website. <https://dhhr.wv.gov/office-of-drug-control-policy/datadashboard/Pages/default.aspx>
584. Ohio Department of Health Hepatitis Surveillance Program. Ohio Hepatitis B Cases, 2015-2018. Published online 2018. [https://odh.ohio.gov/wps/wcm/connect/gov/5c9e0fec-cf4b-4426-87ac-b574c1352b0d/HBV+4+Year+Report\\_2018.pdf?MOD=AJPERES&CONVERT\\_TO=url&CACHEID=ROOTWORKSPACE.Z18\\_M1HGGIK0N0JO00QO9DDDDM3000-5c9e0fec-cf4b-4426-87ac-b574c1352b0d-mLRwdyM](https://odh.ohio.gov/wps/wcm/connect/gov/5c9e0fec-cf4b-4426-87ac-b574c1352b0d/HBV+4+Year+Report_2018.pdf?MOD=AJPERES&CONVERT_TO=url&CACHEID=ROOTWORKSPACE.Z18_M1HGGIK0N0JO00QO9DDDDM3000-5c9e0fec-cf4b-4426-87ac-b574c1352b0d-mLRwdyM)
585. Ohio Department of Health Hepatitis Surveillance Program. Ohio Hepatitis C Cases, 2014-2018. Published online 2019. [https://odh.ohio.gov/wps/wcm/connect/gov/a85bd075-e2e9-4cd3-bd72-480ea66279b2/HCV+5+Year+Report\\_2018.pdf?MOD=AJPERES&CONVERT\\_TO=url&CACHEID=ROOTWORKSPACE.Z18\\_M1HGGIK0N0JO00QO9DDDDM3000-a85bd075-e2e9-4cd3-bd72-480ea66279b2-mLRwTqK](https://odh.ohio.gov/wps/wcm/connect/gov/a85bd075-e2e9-4cd3-bd72-480ea66279b2/HCV+5+Year+Report_2018.pdf?MOD=AJPERES&CONVERT_TO=url&CACHEID=ROOTWORKSPACE.Z18_M1HGGIK0N0JO00QO9DDDDM3000-a85bd075-e2e9-4cd3-bd72-480ea66279b2-mLRwTqK)
586. Ohio DMHAS, Executive Summaries and Full Drug Trend Reports (2009-2019).
587. Ohio Hospital Association. 2017 Ohio Neonatal Abstinence Syndrome Report. Ohio Department of Health. <https://odh.ohio.gov/wps/portal/gov/odh/know-our-programs/violence-injury-prevention-program/media/nas-datatable-2017>. Published 2017.
588. Olfson M, Crystal S, Wall M, Wang S, Liu S-M, Blanco C. Causes of Death After Nonfatal Opioid Overdose. *JAMA Psychiatry*. 2018;75(8):820-827. doi:10.1001/jamapsychiatry.2018.1471
589. Opioid crisis adds to issues for W.Va. Agencies. News and Sentinel. <https://www.newsandsentinel.com/news/local-news/2019/11/opioid-crisis-adds-to-issues-for-w-v-a-agencies/>
590. Opioid Hospital Stays. Emergency Department Visits - HCUP Fast Stats

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*Keyes Report*

21. Social norms, attitudes, and behavior: how do we harness intention for public health prevention? Columbia University Epidemiologic Science Symposium, April 2014, New York, NY
22. Age, period, and cohort effects: an introduction to theory and approaches to analysis. CUNY School of Public Health Epidemiology and Biostatistics Seminar Series, Invited lecture, November 2013, New York, NY.
23. Social norms and alcohol use: evidence and recommendations for New York City. Community Services Board Meeting, Invited lecture, New York City Department of Health, March 2013, New York, NY.
24. How does exogenous and endogenous hormone variation affect mental health? New designs for old problems. Psychiatric-Neurological Epidemiology Cluster Seminar, Invited lecture, Columbia University, February 2013, New York, NY.
25. The critical role of social norms in population health. Symposium presentation, Columbia University Epidemiology Scientific Symposium: Charting the Course of Social Epidemiology in the Next 25 Years, Symposium presentation, October 2012, New York, NY.
26. Time trends in alcohol use: Understanding cohort effects, Adult Psychiatry Grand Rounds, Columbia University Department of Psychiatry, May 2012, New York, NY.
27. The Epidemiology of Substance Use Disorders. Sexuality and HIV Seminar, HIV Center for Clinical and Behavioral Science. February 2011, New York, NY

*NATIONAL*

1. The role of epidemiology in assessing causes and interventions in mental health research in the 21<sup>st</sup> century: when does sampling matter? Bridging Science and Society retreat, National Institute of Mental Health, April 2021. Virtual.
2. Age, Period, and Cohort Effects in Alcohol Use in the 20<sup>th</sup> and 21<sup>st</sup> Century: implications for the decades to come. 50<sup>th</sup> Anniversary of the National Institute on Alcohol Abuse and Alcoholism symposium, NIAAA, December 2020. Virtual.
3. The Rapid Decline in Adolescent Mental Health in the 21<sup>st</sup> Century: Magnitude, Causes, and Public Health Implications. Dean's Seminar Series, College of Health and Human Services, George Mason University, January 2020.
4. The changing landscape of adolescent mental health and substance use in the 21<sup>st</sup> century. Epidemiology seminar, National Institute on Drug Abuse, March 2019, Bethesda, MD.
5. Depression's got a hold of me: Gender differences and generational trends in alcohol use and mental health among US adolescents and adults. Epidemiology seminar, Michigan State University, March 2019, Lansing, MI.
6. Psychiatric Disorders after Loss. Dean's Symposium on Death and Dying, Boston University School of Public Health, February 2019, Boston, MA.
7. Depression's got a hold of me: Gender differences and generational trends in alcohol use and mental health among US adolescents and adults. Epidemiology seminar, University of Pittsburgh School of Public Health, February 2019, Pittsburgh, PA.

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*Keyes Report*

8. Does epidemiology matter? Epidemiology and population health science in the 21<sup>st</sup> century. Johns Hopkins School of Public Health, Epidemiology Centennial Symposium, November 2018, Baltimore, MD.
9. Opioid use, disorder, and mortality: past, present, and evidence-based control strategies. Mass Torts Made Perfect conference, invited talk, April 2018, Las Vegas, NV.
10. The epidemiology of opioid use, opioid disorder, and overdose in the United States: past, present, and evidence-based control strategies. Keynote address, Kentucky Association of Counties annual conference, November 2017, Louisville, Kentucky.
11. Fundamentals of age-period-cohort analysis. Epidemiology Seminar Series, February 2017, University of California San Francisco, San Francisco, California.
12. The role of epidemiology in population mental health in the 21<sup>st</sup> century: history, current progress, future directions. Epidemiology Seminar Series, November 2016, Virginia Commonwealth University, Richmond, Virginia.
13. Alcohol use and morbidity across historical time: what does variation tell us about environmental determinants of alcohol-related outcomes? Plenary talk, Research Society on Alcoholism, June 2016, New Orleans, LA.
14. Using complex systems modeling to examine alcohol-attributable homicide in New York City. Invited lecture, Injury Prevention Research Center, Office of the Vice-Chancellor for Research, Social Epidemiology Program, Epidemiology Department, Gillings School of Global Public Health, University of North Carolina, October 2015, Chapel Hill, NC.
15. Racial/ethnic differences in substance use across the life course. Grand Rounds speaker, Alcohol Research Group, November 2014, Berkeley, California.
16. A brief introduction to age-period-cohort methodology. SER Experts presentation, Society for Epidemiologic Research, June 2014, Seattle, WA.
17. Time in the causal landscape: problems and possibilities in age-period-cohort research. Survey Research Center, February 2010, Ann Arbor, Michigan.

*INTERNATIONAL*

1. The mental health of adolescents in the 21<sup>st</sup> century: time trends and how they inform etiology. Leaders in Prevention Summit, August 2020, Sydney, Australia. Virtual.
2. Does epidemiology matter? Epidemiology and population health science in the 21<sup>st</sup> century. University College London Department of Psychiatry, April 2019, London, England.
3. How health disparities are obscured and underreported in national survey data, and implications for policy. University of Glasgow, April 2019, Glasgow, Scotland.
4. Depression's got a hold of me: Gender differences and generational trends in alcohol use and mental health among US adolescents and adults. Centro de Investigación en Sociedad y Salud, Universidad Mayor, November 2018, Santiago, Chile.
5. The role of epidemiology in population mental health in the 21<sup>st</sup> century: history, current progress, future directions. Seminar Series, April 2017, French National Institute of Health and Medical Research (INSERM), Paris, France.

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*Keyes Report*

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548. Nash, B. Cabell Huntington registered nurses begin seeking union representation. [https://www.herald-dispatch.com/news/cabell-huntington-registered-nurses-begin-seeking-unionrepresentation/article\\_42cf7177-58de-5bfe-af74-411ab2da4f8b.html](https://www.herald-dispatch.com/news/cabell-huntington-registered-nurses-begin-seeking-unionrepresentation/article_42cf7177-58de-5bfe-af74-411ab2da4f8b.html)
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551. Nathan Hartle Deposition Testimony Excerpts – MDL 2804, Volume 1, July 31, 2018
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553. National Academies of Sciences, Engineering, and Medicine 2021. High and Rising Mortality Rates Among Working-Age Adults. Washington, DC: The National Academies Press. <https://doi.org/10.17226/25976>.
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  533. Monnat SM. Factors Associated With County-Level Differences in U.S. Drug- Related Mortality Rates. *Am J Prev Med*. 2018;54(5):611-619. doi:10.1016/j.amepre.2018.01.040
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  539. Munzing T. Physician guide to appropriate opioid prescribing for noncancer pain. *Perm J*. 2017;21:16-169. doi:10.7812/TPP/16-169

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## Keyes Report

6. The role of epidemiology in population mental health in the 21<sup>st</sup> century: history, current progress, future directions. *Seminar Series*, August 2017, National Institute of Occupational Health, Oslo, Norway.
7. The role of epidemiology in population mental health in the 21<sup>st</sup> century: history, current progress, future directions. *Key note address, Epidemiology Student Research Day*, April 2017, McGill University, Montreal, Canada.
8. The role of epidemiology in population mental health in the 21<sup>st</sup> century: history, current progress, future directions. *Epidemiology Seminar Series*, April 2017, University of Capetown, Capetown, South Africa.
9. Why does epidemiology matter? Invited lecture, *International Journal of Epidemiology Conference*, October 2016, Bristol, UK.
10. Cohort studies in epidemiology: considering cross-generational influences on health. Invited speaker, *World Psychiatric Association Epidemiology Section*, April 2016, Munich, Germany.
11. How and why do psychiatric disorders change across time. *Canadian Association of Psychiatric Epidemiology*, Keynote speaker, September 2015, Vancouver, Canada.
12. Advances in age, period, and cohort effect analysis. *Faculty of Health Sciences Research Seminar Series*, Invited lecture, September 2015, Vancouver, Canada.
13. The burden of loss: unexpected death and psychiatric disorders across the life course. Symposium presentation, *World Psychiatric Association Epidemiology Section*, October 2014, Nara, Japan.
14. Age, period, and cohort effects: an introduction to theory and approaches to analysis. *University of Manitoba Clinical Health Sciences, Department of Psychiatry*, Invited lecture, January 2013, Winnipeg, Canada.

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*Keyes Report*

## Katherine Keyes, PhD Expert Report

MDL Case Track 3  
Case No. 1:18-op-45032 and No. 1:18-op-45079 Opioid Litigation

# EXHIBIT B

## Materials Considered

Exh. B-1

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512. McCann Exhibit 1.7
513. McCann, K. et al. Structured Management of Chronic Nonmalignant Pain with Opioids in a Rural Primary Care Office. *J Am Board Fam Med* 2018;31:57– 63
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516. McDonald EM, Kennedy-Hendricks A, McGinty EE, Shields WC, Barry CL, Gielen AC. Safe storage of opioid pain relievers among adults living in households with children. *Pediatrics.* 2017;139(3):e20162161. doi:10.1542/peds.2016-2161
517. McKenzie M, Zaller N, Dickman SL, et al. A randomized trial of methadone initiation prior to release from incarceration. *Subst Abus.* 2012;33(1):19-29. doi:10.1080/08897077.2011.609446
518. McKesson Agrees to Pay Record \$150 Million Settlement for Failure to Report Suspicious Orders of Pharmaceutical Drugs. DOJ
519. McKesson Corporation Agrees to Pay More than \$13 Million to Settle Claims that it Failed to Report Suspicious Sales of Prescription Medications. USDOJ
520. McKinney, Ralph E., "Barriers to Employment: A Substance Abuse Story" (2019). Faculty Research Day. 7.
521. McLellan, Turner. Prescription Opioids, Overdose Deaths, and Physician Responsibility. *JAMA The Journal of the American Medical Association*
522. Medical Schools in West Virginia - Medical School Headquarters
523. Meltzer EC, Rybin D, Saitz R, et al. Identifying prescription opioid use disorder in primary care: diagnostic characteristics of the Current Opioid Misuse Measure (COMM). *Pain.* 2011;152(2):397-402. doi:10.1016/j.pain.2010.11.006
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Exh. B-29

*Keyes Report***Dr. KATHERINE KEYES MATERIALS CONSIDERED**

1. 2010 MAT treatment SAMHSA
2. 2012.03.07 CAH v Holder et al. Memorandum of Opinion. Case 1:12-cv-00185-RBW
3. 2016 West Virginia Overdose Fatality. [https://dhhr.wv.gov/bph/Documents/ODCP Reports 2017/2016 West Virginia Overdose Fatality Analysis\\_004302018.pdf](https://dhhr.wv.gov/bph/Documents/ODCP%20Reports%202017%202016%20West%20Virginia%20Overdose%20Fatality%20Analysis_004302018.pdf)
4. 2016 OD Death Demographics Report
5. 2016 WV Overdose Fatality Analysis. Healthcare Systems Utilization, Risk Factors, and Opportunities for Intervention.
6. 2016.12.22 U.S. v Kinray, LLC. Consent\_decree. Case 1:16-cv-09767-RA
7. 2017 State Profile — West Virginia National Survey of Substance Abuse Treatment Services (N-SSATS) SAMHSA
8. 2017.08.17 Hartman email ABD CMDL00571804\_image (004)
9. 2018 U.S. Census WV Cabell Huntington Data
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12. Adoption & Foster Care Statistics. Children's Bureau: An Office of the Administration for Children & Families. <https://www.acf.hhs.gov/cb/research-data-technology/statistics-research/afcars>.
13. Agency for Healthcare Research and Quality
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376. Huntington Resiliency Plan Inpatient-Residential Services Workgroup Meeting Minutes 6-28
377. Huntington Resiliency Plan Legal-Policy-First Responders Workgroup Meeting Minutes 7-3
378. Huntington Resiliency Plan Outpatient Services Workgroup Meeting 6-25
379. Huntington Resiliency Plan Prevention Workgroup Meeting Minutes 6-26
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153. Communication with David Chaffin, MD, FACOG – Professor, Marshall University
154. Communication with Ellen A. Thompson, MD – Professor, Marshall Health, Huntington, West Virginia
155. Communication with Gordon Merry – Cabell County EMS Director
156. Communication with Hank Dial – City of Huntington Police Chief
157. Communication with Jan Rader – City of Huntington Fire Chief
158. Communication with Kathleen Mezsaros – Trumbull Medical Examiner's Office, Trumbull County, Ohio
159. Communication with Keith Thomas – Coordinator of Student Support, Cabell County Schools
160. Communication with Kelly Watts – Assistant Superintendent, Division of Instruction and Leadership, Cabell County Schools
161. Communication with Kim Fraser – Director of ADAMHS Board, Lake County, Ohio
162. Communication with Lauren Thorp – Trumbull County Mental Health and Recovery Board, Trumbull County, Ohio
163. Communication with Lyn O'Connell, PhD – Associate Director of Addiction Sciences, Marshall Health
164. Communication with Marcia Knight – Director of Education, Cabell County EMS

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166. Communication with Mary Pshock – County Coroner's Office, Lake County, Ohio
167. Communication with Michael Kilkenny, MD – Director, Cabell County Department of Public Health
168. Communication with Ray Cornwell – City of Huntington Police Captain
169. Communication with Rocky Johnson – City of Huntington Police Department, Police Captain, Special Investigations Bureau (Former)
170. Communication with Sean Loudin, MD – Associate Professor, Marshall University School of Medicine
171. Communication with Stephen Petrany, MD – Chair of Family & Community Health, Marshall University School of Medicine
172. Communication with Steve Murray – Assistant Director, Cabell County EMS
173. Communication with Steve Williams – Mayor of Huntington
174. Communication with Tim Hardesty – Assistant Superintendent, Division of District Support and employee Relations, Cabell County Schools
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